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TECHNOLOGY DEPT.

SEPTEMBER 23, 1950

SCIENCE NEWS LETTER

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DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE

"Built-In" Bait

See Page 198

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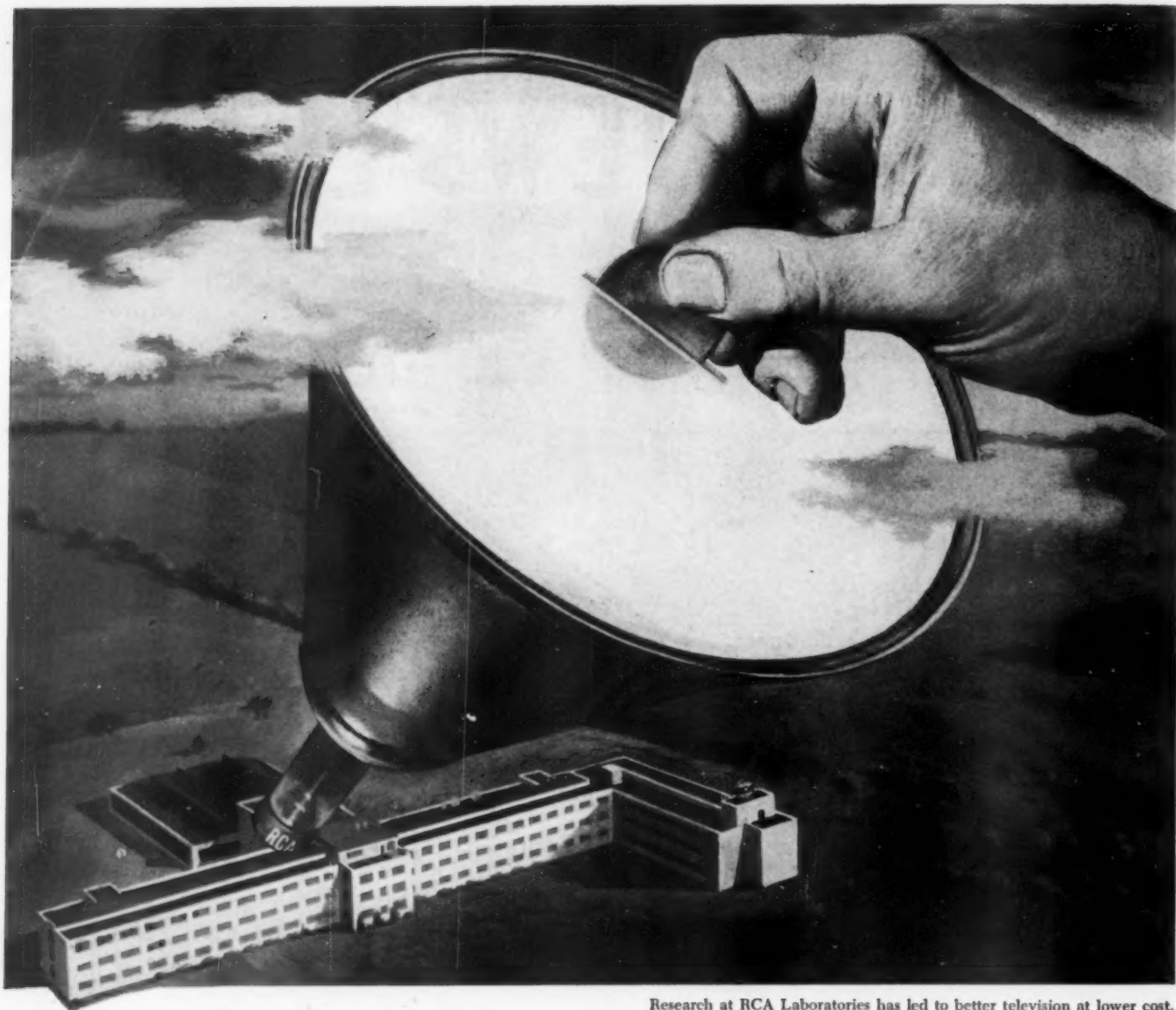
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Research at RCA Laboratories has led to better television at lower cost.

Do you know this Television "Savings Plan"?

For your most effective "television savings plan" look to scientists at RCA Laboratories, whose long-range program of *planned research* has helped bring the finest home television receivers within the reach of millions of families.

For example: by research into simplified circuits and electron tubes—where one tube may do the work of 3—these scientists pointed the way to simplified assembly of better receivers... and the savings were passed on to you! Their research led to the Filterglass faceplates used on all RCA

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Benefit by RCA's *planned research*. See the 1950 RCA Victor television receivers—better than ever... and selling at lower cost.



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CHEMISTRY

Tritium Found in Air

Although tritium, the world's rarest natural chemical element, has been found in the moisture of the air, it will not be extracted from air in securing material for H-bombs.

► MATERIAL for making hydrogen bombs will not be extracted from the air even though one of the H-bomb ingredients, tritium (triple-weight hydrogen) has been discovered in very small amounts in the moisture of the air.

It is found as one part of tritium in a million times a million times a million (1,000,000,000,000,000) parts of the water's hydrogen.

The real importance of the identification of this natural tritium made by cosmic rays is the fact that it is the world's rarest natural chemical element.

Recognition of naturally occurring tritium, announced by Dr. Aristid V. Grosse of Temple University's new Research Institute, as a result of his studies with Dr. W. F. Libby of the University of Chicago, climaxes a 15-year-old scientific dispute as to whether the short-lived isotope exists only when man-made. The team of atomic scientists find that it is constantly being made in nature by action of cosmic rays on the nitrogen of the air.

Discovered as the result of atomic bombardment by the British scientist, Lord Rutherford, tritium was believed to exist only as a man-made particle until 1935, when Dr. Hugh S. Taylor, of Princeton University, discovered indications of tritium in water concentrated electrolytically in his laboratory. Dr. Taylor and his associates were at the time studying the then newly discovered deuterium, the heavy hydrogen which is not radioactive. They based their claim to finding tritium on determination of the weight of the hydrogen in water from various parts of the United States. In this study they had found that water in the clouds crossing the Rocky Mountains is separated according to the weight of the isotopes of hydrogen which compose it.

Taking a sample of water containing tritium with him, Dr. Taylor in 1935 went to London to visit Lord Rutherford, and was roundly denounced by the scientific leader for claiming an impossibility. Rutherford then gave Dr. Taylor one cubic centimeter of concentrated water and challenged him to find tritium in it. Today's techniques, with much greater accuracy in measuring radioactive strength, have proved that the sample to which Rutherford pinned his faith was giving off radioactive disintegration products of tritium all the while.

Besides the sample from Rutherford's laboratory, sent to Dr. Grosse and Dr. Libby for analysis by Dr. Taylor, other samples of water concentrated by electroly-

tic action have been analyzed by the research team. One sample was furnished by the Norsk hydroelectric plant, for which Norway has received scientific thanks. This sample came from the surface waters of the ocean. Its tritium content is to be compared with other samples from equatorial regions and from the depths of the sea. Cosmic rays, which are believed to be the source of tritium in nature, are more plentiful in the northern regions of the earth, and have more effect near the surface than at great depths in the ocean. Turbulence of the ocean waves mixes the surface waters, but is believed not to disturb layers of water below about 300 feet.

There should be more tritium at the north pole than at the equator because there is more cosmic ray bombardment in the northern latitudes due to the focusing of the cosmic radiation by the magnetic field of the earth.

There should be more tritium, just as there is more deuterium (double-weight hydrogen), in the water of rain on one side of the Rocky Mountains than the other side to which the storm travels.

There is little practical use of naturally

occurring tritium just now. The extremely accurate methods of detection of its radioactivity would hardly be useful for childish snooping to see who is making tritium for bombs behind our backs.

Three years ago Drs. Grosse and Libby discovered that cosmic rays produce radioactive carbon 14 in living matter. This has provided a reliable radioactive method for determining the age of archaeological samples.

Science News Letter, September 23, 1950

MEDICINE

Federal Funds to Aid Attack on Artery Disease

► THE ATTACK, via fat, on one kind of artery disease which causes many heart deaths will be intensified with a war fund totalling \$230,773 just granted by the U.S. National Heart Institute to four non-federal research institutions.

The artery disease is known as atherosclerosis. Its consequences are responsible for 40% of the 750,000 heart and artery disease deaths each year in the United States. It can affect younger as well as older persons.

Fat molecules in the blood have been implicated as the cause of this artery disease. Further research on this point will be pursued under the grants made to the University of California, Harvard School of Public Health, Cleveland Clinic and the University of Pittsburgh.

Science News Letter, September 23, 1950



"FINAL INSPECTION"—The above photograph by Robert A. Buchanan, United States Steel Research Laboratory, won first prize in the General Section, Black and White Prints, in the Seventh American Society Testing Materials Photographic Exhibit.

MEDICINE

Drug Stops Polio Pain

► USE of a drug instead of moist hot packs to relieve pain, muscle spasm and circulatory trouble in poliomyelitis is reported by Dr. Emil Smith and associates of the Kingston Avenue Hospital, Brooklyn, N. Y., in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 16) in Chicago, Ill.

The drug is known by the trade name of priscoline. Heretofore it has been used for disorders of circulation and high blood pressure.

Polio patients, the Brooklyn group reports, began to improve within 30 minutes after getting the drug by mouth and even faster when it was given by injections into the muscles. When the dose was big enough to produce a good effect, the "patients experienced a sense of well-being and sighed with relief," the doctors state.

"The pain either diminished or disappeared entirely. In most cases muscle tightness diminished and they were able to move the non-paralyzed parts more freely. They rested more comfortably during the day. Their appetite improved and they enjoyed their food. The majority stated that they were able to sleep comfortably for the first time since the illness began. Muscle twitchings present in some of the patients receded. Cold and clammy skins became warm, and excessive sweating disappeared."

The drug was given to 663 patients during the year 1949. It does not stop the spread of the polio virus through the central nervous system or alter its effects on nerve cells or prevent paralysis. It is not presented as a cure but as an aid in shortening the period of muscle spasm and pain so that rehabilitation treatment can be started as early as possible.

Unpleasant effects were nausea and vomiting, heart palpitation, chills, diarrhea and in five patients a feeling of things crawling

on their skin.

The Brooklyn doctors tried to avoid giving the drug to patients with encephalitic, bulbar and bulbospinal polio and to those in iron lungs.

Associated with Dr. Smith in this study were Drs. David J. Graubard, Joseph Falcone, Thurman B. Givan, Philip Rosenblatt and Mr. Avner Feldman.

Science News Letter, September 23, 1950

VETERINARY MEDICINE

Tender Steaks Now May Mean No Steaks in Future

► TO satisfy the appetites of sirloin steak buyers, U. S. ranchers may be progressively fattening their cows to the point where they cannot have calves, the American Veterinary Medical Association was told in Miami Beach, Fla.

Dr. G. T. Easley of Sulphur, Okla., warned that long years of selective breeding with an eye toward plumpness of beef cattle can produce cows apparently normal in every respect, yet unable to conceive and bear.

To produce tender steaks, ranchers in effect have been breeding cows with slowed-down thyroid glands. This condition, said Dr. Easley, obstructs normal functioning of the reproductive system. Excessive fat may hinder blood circulation, lower resistance to infection and impair the fertility of a cow.

Treatment with thyroid preparations and ordinary reducing diets may both show startling results in calving performance, he said.

Another cause for trouble in breeding was suggested to the annual veterinarians' conference earlier by Dr. A. H. Frank of the U. S. Department of Agriculture's Animal Disease Center at Beltsville, Md.

More than half the cows in a group of 2,000 Maryland cattle have impaired breeding performance, he reported. A study of commercial dairy and beef herds showed 25% of the females, although free from recognizable infection, failed to conceive when bred. Another 25% failed to come into heat having once calved.

Neither mechanical stimulation of the reproductive organs nor treatment with pregnant mares' serum was effective, on the whole, Dr. Frank reported.

Science News Letter, September 23, 1950

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Question Box

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Who causes the most accidents? p. 204.

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What animal has a built-in fishing apparatus? p. 198.

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WILDLIFE

How can the age of fur seals be determined? p. 201.

ZOOLOGY

What animal eats the caterpillar "from the inside out"? p. 206.

PSYCHOLOGY

Propaganda Offensive

We need to let the whole world know that we do not want war. Delegates to international conferences should be screened for mental adjustment.

► MAJOR task for the United States in the present world crisis is to reduce the fear that Russia has of the United States, Prof. Otto Klineberg, of Columbia University, told his colleagues in State College, Pa., at the meeting of the American Psychological Association.

"We cannot disarm," he said. "That would be too dangerous at this juncture. We can, however, embark upon a powerful propaganda or informational offensive, designed to make clear to the whole world, including the Soviet Union, that we want peace and not war; that we will never start a war, not even a preventive war."

Psychologists know that aggression may be born of fear. The violent "running amok" which afflicts some Indonesian natives was found to be due to the conviction on the part of the sufferer that he is about to be attacked by others. He slashes about in fury to protect himself from his imaginary enemies. In a similar manner, one of the factors of Soviet aggression against us may be fear of us.

Psychologists also know that a person's way of viewing an action, or even an object, is influenced by his nationality and other group affiliations.

U. S. diplomatic and military actions should be planned with this fact in mind, Prof. Klineberg suggested. American aid to Greece and Turkey, for example, is seen differently by ourselves and the Soviet leaders. What looks right to us as a legitimate means of aiding these countries to remain free, looks to the Russians like a threat to themselves.

Delegates to international conferences should be screened for mental adjustment, Prof. Klineberg suggested.

"Not a few international conferences have been wrecked," he said, "by the presence of one or more participants who were insecure, oversensitive, suspicious or resentful, to a degree which indicated that they were not psychologically healthy individuals."

Before a man is allowed to attain a position of national leadership, he should be certified as "normal" by a panel of experts from an independent organization such as the World Health Organization, the World Federation for Mental Health or an International Association of Psychologists, Prof. Klineberg proposed. We make candidates for the police force pass tests of physical and mental capacity, why not national leaders? If such a test had been in

use, Hitler, Goering, Himmler, Hess, and Streicher could not have reached power, he stated.

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CHEMISTRY

Outdoor Chemical Plants Provide Greater Safety

► OUTDOOR plants for manufacturing chemicals, particularly where explosion and poisoning hazards may exist, have many advantages, the American Institute of Chemical Engineers was told in Minneapolis, Minn. Now quite general in oil refineries, they are suitable for other industries.

Unhoused chemical plants can advantageously be installed in Canada and Michigan, with their long winters, as well as in warmer country, the engineers were told by William H. Williams, Dow Chemical Company, Midland, Mich.

The out-of-doors plant has many advantages, he said, of which reduction in operating hazard and maintenance costs is probably the most important.

Perhaps the principal cause of disaster in the operation of an organic chemical plant, handling materials that are flammable but not explosive in nature, is explosion caused by the confinement of vapors in a restricted space.

This is the opinion of Homer Kieweg, Commercial Solvents Corporation, Terre Haute, Ind. Concentrations of vapors in the explosive ranges are likely to occur due to some failure of equipment or operation, he said. Prevention of explosive mixtures in confined spaces under these conditions is oftentimes impossible. With outdoor plants this danger is eliminated.

The former general custom of housing chemical plants in totally enclosed-type structures is gradually being reversed in the direction of outdoor-type installations, the meeting was told by representatives of the E. B. Badger & Sons Company, Boston. Petroleum refineries were cited as examples.

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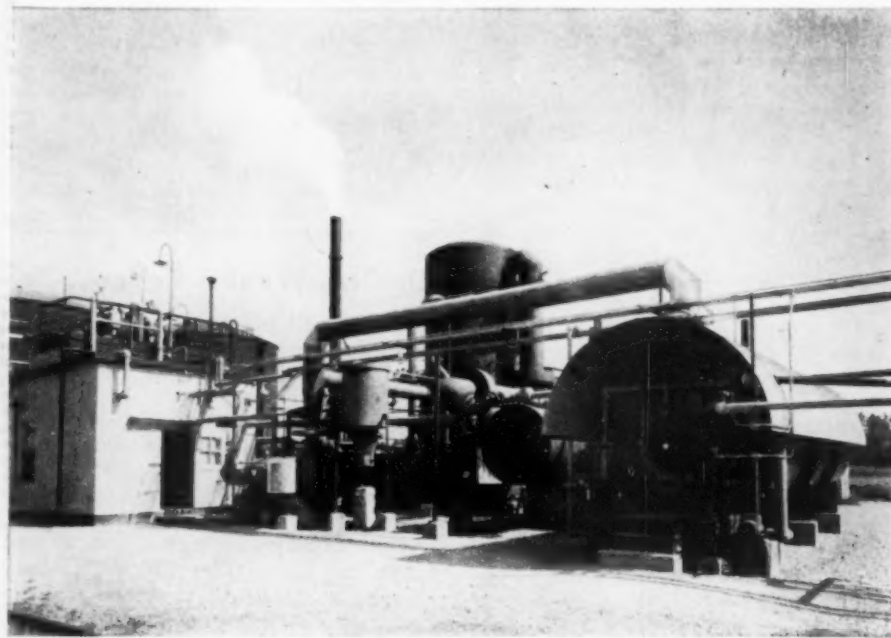
BOTANY

Naphtha Spray Kills Evergreen Nursery Weeds

► A FINE spray of mineral spirits or naphtha can take the weeds out of evergreen nurseries at a cost of only a tenth that of the usual laborious hand weeding, J. H. Stoeckeler, forester in charge of the Northern Lakes Forest Research Center, Rhinelander, Wis., reported to the American Chemical Society in Chicago, Ill.

Such sprays applied at relatively high pressure are effective on seedbeds of pine, fir, juniper and spruce, but broadleaf species such as elm, oak and maple are killed by the naphtha.

Science News Letter, September 23, 1950



OPEN AIR CHEMISTRY—An American Cyanamid Company commercial-size plant in Hamilton, Ohio, for the production of sulfuric acid is an example of chemistry in the open. Operating hazards and maintenance costs are cut to a minimum in this type of plant.

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ASTRONOMY

Eclipse of Moon

A total eclipse of the moon will occur on Sept. 25 and 26. This will be the last total eclipse until the first part of 1953.

► THE BIG celestial show for this month is the total eclipse of the "harvest" moon on the night of Sept. 25 and 26. Only a last minute veto of the weatherman will cause cancellation of the performance as viewed from the earth.

The show will be visible during the late evening hours throughout the United States and most of the Western hemisphere. The entire performance will last five hours, 53.5 minutes, although the moon is totally eclipsed only 46 minutes.

Lunar eclipses occur when the moon, as it revolves around the earth, passes into the great conical shadow cast by the earth in space. By putting a bright light on a table in the middle of an otherwise dark room, then walking around the table and watching the wall, you can get an idea of how the shadow of the earth sweeps across space.

There are two parts to the earth's shadow, as there are to every shadow cast by an object where the light source has an appreciable size. The inner core is called the umbra and is the true shadow. Around this there is a region of partial shadow known as the penumbra.

The edge of the moon first enters the

penumbra at 8:20 p.m. E.S.T., but so little sunlight is cut off that it will take until about the time the moon enters the umbra to notice a change in its brightness. This will be at 9:31.5 p.m. E.S.T.

The total phase of the eclipse begins at 10:54 p.m. E.S.T. Before totality begins, the earth's shadow on the moon will have appeared gray, then black. However, as totality commences, the moon takes on a coppery-red glow. Although the earth completely eliminates the direct solar rays, some of them are bent by prismatic action of the earth's atmosphere thus giving the moon its coppery-red color, since red predominates in the light thus bent. This same effect is observed in the sunset's red color.

Totality is over at 11:40 p.m. E.S.T. The moon leaves the umbra at 1:02 a.m. E.S.T. on Sept. 26, and the whole performance will be over and the moon again shining with undimmed brilliance at 2:14 a.m. E.S.T.

This will be the last total eclipse of the moon visible from the United States until Jan. 29, 1953. There will, however, be a partial eclipse on Feb. 10, 1952.

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ASTRONOMY

"Shooting" the Eclipse

► YOU can take a picture of the eclipse of the moon on Sept. 25 with your own camera in your own backyard, weather permitting.

Your camera must be one which can be focused for infinity, and you must have a good, solid support for it. This support need not be a tripod—a chair or a fence-post with a chunk of wood or a solid book to give the correct angle to the camera will serve.

Your picture of the moon in eclipse will probably come out better if you keep the lens open all the time, shielding it with a piece of black cardboard when the film is not being exposed. In this way, you will not jar the camera, thus spoiling your picture.

The kind of film you use and your lens opening will affect the exposure time necessary for a good shot. To be absolutely certain that you have the right settings, it would be a good idea for you to take some trial pictures of the moon a day or two before the eclipse is scheduled. Then the moon will be about the same brilliance as on the night of the big performance.

Test various exposure times with different lens openings, varying only one of these at a time and keeping a record of the settings used for each picture. A lens opening of $f/8$ and an exposure time of one second could be used for the first trial photograph. If you do not have time to make test runs, for the eclipse itself try a one-second exposure for a lens opening of $f/32$, or one-fourth of a second for lens opening $f/16$ or one-twenty-fifth of a second for $f/8$. A box camera would take about a fifth of a second exposure.

Set the distance for infinity and use high speed panchromatic film for best results. Avoid taking pictures during the times the sky is cloudy.

Because exposures are made in the dark, it is best to test the steps necessary to get a complete record of the moon's eclipse before you actually start to take the pictures. Be sure that no light other than that from the moon shines into the lens of your camera.

Just before the moon begins to enter the full shadow (9:31.5 p.m. E.S.T.), adjust your camera so that it is aimed for the center

of the path which the moon will follow across the sky. This would mean about 15 degrees west of the moon's position when you begin. If you adjust your finder so that the moon is in the lower left hand corner, it will be correctly aimed and the moon should then be in the lower left part of your negative when it enters the first visible stage of the eclipse.

Take your first picture when the edge of the moon first disappears and another picture every ten minutes after that until eight pictures are taken. Then the eclipse will be total.

At that time, if you wish to take pot luck with a roll of film, you can try to see what pictures you can turn out of the moon in full eclipse. Test an exposure time of four or five seconds. It might also be possible to record some of the coppery color on color film, using a very wide lens opening.

When the moon emerges from totality at 11:40 p.m., you can record the second half of the eclipse by taking a picture every ten minutes for the hour and 12 minutes until the moon passes out of the earth's deep shadow or umbra. This should be done with a new film and your camera should again be aimed at the middle of the expected path.

Either for the series of pictures of the earth's shadow covering up the moon or for the pictures of totality, if you attempt those, it is not necessary to move your camera. The rotation of the earth will space the images on your film properly. The moon moves its own distance in approximately two minutes.

Your pictures of the eclipsed moon will be more satisfactory if the focal length of your camera is at least 10 inches. Whatever the focal length of your camera, the photograph that you take of the moon will reduce its image to approximately one-hundredth of that focal length, so the moon in your picture may be quite small.

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On This Week's Cover

► THE Reddish Frogfish is one of those odd creatures that is equipped with a "built-in" fishing apparatus. The fish has a very large mouth above the center of which projects a long whip-like ray. A small tag of flesh known as a lure is attached to the end of the ray. When the fish becomes hungry and a suitable fish is near, the lure is tossed to and fro, and as the rod is almost invisible, the bait looks like some tiny creature. The attracted fish tries to catch it whereupon the wily frogfish gives him a merry chase which leads directly into the mouth of the frogfish. Net result: A sad ending for the attracted fish but a succulent meal for the frogfish.

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GENETICS

Mutation Accelerated

The mutation rate for certain genetic factors in corn has been increased. Artificial mutation is thought to be different from natural mutation and is now being avoided.

► THE EVOLUTIONARY changes blasted into living things by X-rays and A-bomb radiations are not the same as those caused by the changes in germ plasma—mutations the scientists call them—that occur naturally.

But there is hope that these extremely slow and rare changes in the hereditary stock of all living things that occur in nature can be speeded up by the same process of selective breeding that has produced superior plants and animals for our modern agriculture.

An outstanding new development reported at the golden jubilee meeting of the Genetics Society of America, celebrating the first 50 years of genetics, was the acceleration of natural mutation reported by Dr. L. J. Stadler of the University of Missouri.

Working with a special kind of corn, the heredity of which has been studied for years, Dr. Stadler has been able by cross-breeding to obtain about a hundred times the normal mutations of a few of its thousands of genes, or carriers of heredity.

So complex are these extremely minute portions of cells, which carry on life from generation to generation, that biologists

must work with very special sorts in order to discover the laws of inheritance that are generally applicable.

Changes in these genes are believed to be the mechanism of evolution itself. A quarter century ago it was discovered that X-rays and even ultraviolet light, acting like submicroscopic machine gun bullets, could damage genes and produce changes in heredity that could be carried on into later generations. Hailed at first as a means of producing the equivalent of natural evolution, geneticists are now fearful that artificial mutations use another mechanism and they are turning again to natural mutations for their studies.

Dr. Stadler's success in increasing the mutation rate for genes controlling color of corn seed and plants gives new hope to this line of research, which is still tedious and time-consuming. He has shown that a tendency to change is inheritable, as it were.

The new findings do not lessen the danger of radiations to human, other animal and plant populations, for severe doses of X and other radiations are still dangerous to future generations, possibly producing monstrosities for the future.

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mycin, a new member of the modern family of wonder drugs.

Science News Letter, September 23, 1950

INVENTION

No Flame or Electric Arc In Cold Pressure Welding

► WELDING such metals as aluminum and copper without the use of hot flames or electric arcs is possible with a cold pressure process on which the government issued a patent recently. It can be used with many non-ferrous metals.

Patent 2,522,408 was issued to Anthony Bagnold Sowter, Wembley, England, for this process. Rights have been assigned to General Electric Company, Limited, London.

As described by the inventor, the process involves bringing the metals to be welded into contact with each other. Then by the application of pressure, the metals are caused to flow away from the welding point and into interleaved relation with the grains of the metals being welded.

Before welding, oxide films and other impurities on the metals are removed. In aluminum welding a pressure of from 12 to 18 tons per square inch is used. With copper, two to four times this pressure is required.

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MILDEW CONTROL—The canvas bucket and webbing at the left have been protected against mold decay by one of the Cunilates developed for the Air Force. Victor N. Kalberg, who developed solubilizing technique, compares them with similar items which almost completely disintegrated after 28-day soil burial test. The Cunilates are available in permanent and non-toxic solutions and emulsion.

BIOLOGY

Fungus Rot GI Headache

► FUNGUS rot, the work of tiny microorganisms which attack even plastics is becoming a major headache to U. S. armed forces.

In a two-day symposium at the American Institute of Biological Sciences meeting at Ohio State University, scientists described the type of decay reported to have brought failure in Korea of communications equipment stored since World War II on tropical Pacific islands.

Electrical power drives for gun mounts, electronic hook-up wire and similar equipment can deteriorate fast from fungus attack, even in parts of the world where high humidity is not a serious problem, Dr. Walter N. Ezekiel of the Navy's Bureau of Ordnance said.

Certain types of fungus and bacteria, said Dr. James V. Harvey of the Philadelphia Quartermaster Depot's biological laboratories, will destroy flexibility in plastic films used to insulate such equipment.

Such attack is complicated. Fungus

grows in mold. Bacteria come along, and because of antibiotic activity, attack the fungus. Then the bacteria in turn attack the plasticizing agent in the insulation.

At Rensselaer Polytechnic Institute, researchers working under armed forces contract found that insulation began to break down under fungus rot within 12 hours of exposure to high humidity and temperatures, Dr. Mary P. Gauvey reported. The attack can come from the inside out, she said. Insulation resistance began to drop before outside mold became visible.

The fungi are extremely hard to stop. Various anti-fungus chemicals have been incorporated into the plastics, Dr. Harvey said, but without much effect. A coating that is poisonous will not stay poisonous, a team of scientists from Battelle Memorial Institute in Columbus reported.

From Notre Dame scientists came one possibility. Fungus was reported by Drs. J. A. Jump and K. S. Gopalkrishnan to be killed by an antibiotic cousin of strepto-

MILITARY SCIENCE

Korean War Tougher Than World War II

► THE Korean war is tougher than World War II. Men who went through Normandy, Anzio and Pacific battles without breaking but who are casualties of the present fighting told this emphatically to Dr. Karl Bowman, University of California Medical School psychiatrist.

Dr. Bowman, who has just returned from Japan, saw the men in hospitals that he visited for the Surgeon General of the Army.

Patterns of psychiatric cases among American veterans in the Korean war are following those of World War II, Dr. Bowman found. Mostly there are cases of combat fatigue, with few cases of conversion hysteria.

Dr. Bowman said that while figures are not available, one would expect a larger percentage of psychiatric casualties from the earlier stages of battle for following reasons: the soldiers were not adequately trained, seasoned, equipped; the fight was a losing one and seemingly hopeless for men on the ground; the North Koreans were better trained and equipped than anticipated.

The nature of the fighting does not yet permit psychiatric clearing posts near the front line for quick treatment, as in World War II. Casualties are now evacuated to Japan. Dr. Bowman says the Army is doing an excellent job in evacuating and treating patients. During his short stay, one hospital returned 70% of casualties to combat and anticipated the return of a large per cent of the remainder to non-combat duty.

Dr. Bowman says that as the United States moves to the offensive, fewer psychiatric casualties can be expected.

Science News Letter, September 23, 1950

BOTANY

Poinsettias Blossom Just In Time for Christmas

► THREE government scientists gave the nation's flower-lovers a Christmas present—a way to nudge poinsettias into putting forth their bright red leaves just in time for the holiday season. The secret: keep them in the dark for at least 13 hours a day.

Drs. M. W. Parker, H. A. Borthwick and Laura E. Rappleye of the Agriculture Department's Bureau of Plant Industry described their experiments with poinsettias before the American Society for Horticultural Science in Columbus, Ohio. Blooming of the Christmas plant can be either slowed or speeded up, they said, by varying the ratio of daytime to darkness. This response of plants to different day lengths is known as photoperiodism.

Poinsettias need short days, the research-

ers said. If cuttings are started between Oct. 1 and 10 and kept in total darkness 14 to 16 hours a day, the flowers and scarlet leaves will bloom without fail for Christmas, they said. Less than 13 hours of darkness will slow the blooming greatly. It can be hastened by extending the dark period to 16 hours. But if the dark periods are broken too often, the plant will fail to bloom at all.

Science News Letter, September 23, 1950

ENGINEERING

Carbon Dioxide Generator Mobile, Has High Capacity

► A MOBILE carbon dioxide generator will produce the fire-fighting gas needed in large quantities for military uses.

The generator has a production capacity of 300 pounds per hour. It can operate at temperature extremes from minus 40 to plus 130 degrees Fahrenheit and is only about half the size of commercial plants of the same capacity.

The first of these units is now undergoing technical tests at the Army Engineer Research and Development Laboratories at Ft. Belvoir, Va. A second will be delivered soon. The gross weight of the mobile generator is 43,000 pounds. It is mounted on pneumatic dual tires for easy moving.

Science News Letter, September 23, 1950

MEDICINE

Streptomycin, Tuberculin, Effect "Miraculous" Cure

► THE "almost miraculous recovery" of a two-year-old boy, paralyzed and blinded by tuberculous meningitis "for whom all hope of recovery had been abandoned," has been achieved by a combination of one of the new wonder drugs, streptomycin, and an old, abandoned TB remedy, tuberculin.

Details of this treatment, and a warning on how to avoid its dangers, are reported by Drs. Hugh Cairns, Honor V. Smith and R. L. Vollum, of Oxford, England, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 9) in Chicago.

The child's sight returned and within less than a year he was "a fat, active, healthy-looking little boy with a head of normal size, a growing vocabulary and what appeared to be normal intelligence."

Equally good results in a second case have encouraged the English doctors to start this treatment in seven others. It is too early to know what the results will be in these.

The reason the combined treatment was effective seems to be that the streptomycin takes care of the germs while the tuberculin does just what its discoverer in 1890, Robert Koch, claimed it would when he said: "The remedy does not kill the tubercle bacilli but the tuberculous tissue."

Science News Letter, September 23, 1950

IN SCIENCE

PLANT PATHOLOGY

Lack of Minerals May Cause Sick Timothy Grass

► SICK timothy grass may be suffering from a deficiency of minute amounts of certain minerals, Dr. R. D. Williams, British plant physiologist, told the British Association for the Advancement of Science meeting in Birmingham, England.

Iron, copper, manganese and zinc are all needed in one or less parts per million for healthy growth, he stated. When timothy is deficient in iron, manganese and zinc, the plant is wan and weak. Copper-deficient timothy is flushed an unhealthy darker green.

Science News Letter, September 23, 1950

MEDICINE

Coconut Oil Is Quick Energy Source

► INJECTING specially prepared coconut oil into the blood stream can put fat on underweight normal persons and supply energy to many hospital patients unable to eat all the food they need, Dr. Robert P. Geyer of Harvard School of Public Health told scientists at a University of Rochester Medical School symposium in Rochester, N. Y.

The symposium was on lipids, which is a collective name for dietary fat and its various forms. It was held in honor of Dr. Walter R. Bloor, emeritus professor of biochemistry at the University of Rochester Medical School, whose work in this field has made him internationally known as "the dean of fat metabolism."

The coconut oil vein feeding solution is prepared by passing a mixture of purified coconut oil, sugar solution and emulsifying agents through a machine similar to those used for making homogenized milk. The particles of fat in the resulting emulsion are smaller than bacteria.

Patients with stomach ulcers, certain kinds of cancers and kidney diseases and other patients before and after operations are among those who have been helped by these coconut oil feedings. Because the fat gets directly into the blood stream, difficulties such as lack of appetite, inability to swallow food or to absorb it from the intestine are overcome.

Emulsions containing radioactive fats have been given laboratory animals and traced through the animal's bodies. The fat, these studies showed, was rapidly used by the body for energy. Fat-soluble vitamins can be incorporated in the emulsion when needed.

Science News Letter, September 23, 1950

SCIENCE FIELDS

WILDLIFE

Look at Teeth to Tell Age of Fur Seals

► THE AGE of a fur seal can be told from its teeth, with ridges or growth layers around the tooth roots corresponding to the years it has lived.

Because Uncle Sam protects the Alaskan fur seal and his biologists have marked 80,000 young seals with hot-iron brands or numbered metal tags in recent years when the herds come to the Pribilof islands in Bering Sea each summer, Dr. Victor B. Scheffer of the U. S. Fish and Wildlife Service has been able to puzzle out the meaning of the growth ridges in their teeth.

Tooth growth is greatest when the seals are widely spread at sea during winter and spring, but virtually stops in the summer and fall when the animals are at their Pribilof breeding grounds. Males abstain from food and drink during this time, living off their fat, while females nurse their young for four months at the expense of their own growth. This growth cycle is reflected in the teeth, and the layers accurately represent the age of the seal up to four years and occasionally up to seven or eight years.

Biologists have previously been able to estimate the age of fishes by growth lines on scales and some bones. But the rapid growth of fish corresponds to the warmer months of the year, not the colder months as with seals, since fish adopt the temperature of the water in which they live, unlike seals which are mammals.

Dr. Scheffer reported his research to the journal, *SCIENCE* (Sept. 15).

Science News Letter, September 23, 1950

WILDLIFE

Trumpeter Swans Prefer Canada, Alaska to U. S.

► THE U. S. is losing its trumpeter swans, even though the overall North American population of this rare and beautiful bird seems to be booming back from the edge of extinction.

The truth of the matter is, U. S. Fish and Wildlife Service officials report ruefully, the trumpeters seem to be moving to Canada and Alaska.

Only 376 trumpeters showed up this year for the annual swan census at Yellowstone Park and Red Rock Lakes wildlife refuges in Montana. Last year there were 451.

But, say Wildlife Service biologists, more and more trumpeters are reported in Brit-

ish Columbia and southern Alaska. They think the giant birds are moving back to ancient breeding grounds farther north.

Long ago the trumpeters flew in great numbers over all the American Midwest and West, from Missouri to California. But civilization moved in. By 1935, only 73 birds remained in this country. In that year, Red Rock Lakes refuge was established, and the trumpeters got protection by rigid laws.

It is hard to estimate how many birds there are now, one official said. In this country, there may be trumpeters breeding in the few wilderness regions left. As many as 350 have been seen in a single season in Alaska. And in 1948, the Canadian Department of Mines and Resources reported an estimated population of 900 trumpeters in Canada.

Science News Letter, September 23, 1950

EDUCATION

"Pay Attention" Method Discourages New Ideas

► THE teacher who scolds her pupils for being "inattentive," may be maintaining discipline, but she is not preparing a fertile soil for the growth of new ideas.

Actually, there are times when being inattentive is an advantage in preparing the conditions for creative thought, Dr. Edith A. Weisskopf, of Purdue University, told the meeting of the American Psychological Association meeting in State College, Pa.

It is one of the main aims of education, Dr. Weisskopf explained, to encourage the development of creative abilities. Yet it is rare for educators to encourage their pupils to use techniques which are thought to create a fertile soil for the growth of new ideas.

"Among the four stages of the creative process, namely, preparation, incubation, illumination, and verification," said Dr. Weisskopf, "we prepare young people for the first and last stage only."

One reason for the neglect of incubation and illumination, she feels, may be the fact that these two stages appear to be directed more by unconscious forces.

Gifted children can and do master the academic subjects in the elementary and in the secondary school in half the time allotted to these subjects, Dr. Paul Witty, of Northwestern University, a specialist on the education of geniuses, told the same meeting.

Their school work is less satisfactory and challenging to gifted children than to others throughout their high school years, Dr. Witty has found. Speeding them through their grades is the most frequent provision made for talented children, and this usually occurs in the elementary grades. Enrichment of the curriculum takes second place.

Science News Letter, September 23, 1950

BIOLOGY

Protoplasm Seen in Third Dimension for First Time

► THE INTERNAL arrangement of living cells can now be seen, showing life's fundamental protoplasm in three dimensions for the first time. This has been achieved through a new method of drying specimens viewed with the University of Pennsylvania electron microscope.

Dr. Thomas F. Anderson, biophysicist of Pennsylvania's school of medicine, told the International Congress on Electron Microscopy in Paris how a substitution of carbon dioxide under high pressure for the water in biological specimens leaves them unflattened showing details in relief previously unachieved.

The new drying technique can be applied to bacteria, viruses and other materials, opening the way to studying normal and diseased tissues and materials more effectively.

The University of Pennsylvania investigators replaced the water of the materials with a liquid, such as carbon dioxide under high pressure, whose surface tension is very low at ordinary temperatures. Raising the temperature causes the liquid to become a gas which escapes and leaves the delicate portions of the biological specimens uncollapsed. Ordinary drying or freezing and drying flattens the structure of the specimens due to the pull of the surface tension of the water.

Science News Letter, September 23, 1950

STATISTICS

Accidents Fifth Ranking Killer of Women and Girls

► ACCIDENTS kill more women and girls each year than any other cause except cancer and diseases of the heart, blood vessels and kidneys.

Falls account for almost half of the approximately 30,000 accidental deaths of females each year. Most of these, seven out of eight among white women, occur at ages of 65 and over when failing vision and hearing, weakened skeletal muscles and other physical deterioration of age make the person more prone to fall.

Under age 65, motor vehicles are the big cause of death among girls and women, and even in the advanced ages rank second only to falls, Metropolitan Life Insurance Company statisticians in New York report.

Burns and scalds are another important cause of female deaths. Among pre-school girls, scalds caused by falling into or upsetting hot liquids play a large role. At the school ages, burns from playing with matches and clothing catching fire from open flames are the major menaces. After childhood, deaths from burns and scalds reflect the special hazards to which housewives are exposed in kitchen and laundry.

Science News Letter, September 23, 1950

ASTRONOMY

Pegasus High in South

The Winged Horse constellation is prominent on October evenings. The horse which is inverted can be located easily by first finding the "Great Square."

By JAMES STOKLEY

► HIGH in the southern sky on October evenings can be seen a group of stars that form the well-known constellation of Pegasus, the winged horse. Although the stars are not extremely bright, their arrangement makes them easy to locate, serving as a useful guide for the location of other constellations.

It is a good idea to look first for the four stars that outline the "Great Square." This is shown on one of the accompanying maps, depicting the southern skies, as seen from a latitude approximately 40 degrees north. These maps were drawn to give the appearance of the skies at about 10:00 p. m., your own kind of standard time, at the first of October.

At any particular hour the stars and constellations seem to slip around the sky from east to west from one night to the next. Thus in the course of the year many different parts of the celestial sphere come into our view. For this reason, the arrangement shown is seen at about 9:00 p. m. in the middle of the month and about 8:00 p. m. at the beginning of November.

Outline of Pegasus

Actually, only three of the stars that mark the corners of the square are in Pegasus. Alpheratz, the one at the upper left, is in the neighboring constellation of Andromeda. The star in the opposite corner, Markab, is in the shoulder of the horse. The angular line of stars extending to the southwest from Markab is supposed to form the neck and head, for the horse is shown inverted! Enif marks his nose. The assemblage of stars going to the right from Scheat in the upper right corner forms the forelegs. The animal's hind quarters are not shown on the old star maps which used to show the imaginary figures about the stars. Algenib, the star in the lower left corner of the square, is in the wing.

Just below and also to the left of the square, are the stars marking Pisces, the fishes. Below the stars of the head of Pegasus we can see the figure of Aquarius, the water-carrier, where the only planet now easily visible is located. The planet is Jupiter, which is in the southeast at sunset and which remains conspicuous until early morning hours.

Vega in Lyra, the lyre, the brightest star visible these evenings, is seen high in the west. Directly above it is Cygnus, the swan, which contains the first magnitude star

Deneb. The two top stars of the square of Pegasus, followed to the right, serve as pointers to the swan. To the left of Lyra is Aquila, the eagle, with another bright star, Altair.

Low in the south we can see Fomalhaut in Piscis Austrinus, the southern fish, another star of the first magnitude, though its lowness causes a diminution in the apparent brightness. This also is true of Aldebaran in Taurus, the bull, shown rising just a little north of the east point. Next to it toward the left we find Auriga, the charioteer, with brilliant Capella.

Four Planets Visible

In addition to Jupiter, three other planets are visible for short periods. Mars, in the constellation of Scorpius, sets about 2½ hours after the sun, a little too soon to get into the maps. On Oct. 2 Mercury is farthest west of the sun, so for about a week around this time it is visible low in the east as dawn is breaking. Saturn, considerably fainter, is in the same part of the sky, and Mercury passes close by it at 4:00 a. m., EST, on Oct. 6.

At the beginning of the year when Jupiter was visible in the western sky at twilight, it was not where we see it now, but in the constellation of Capricornus, the sea-goat, next-door to the right from Jupiter's present home. Until about the middle of March the planet was too close to the sun's direction to be seen with ease. Then it appeared as a morning star, seen in the east before sunrise. With the change of the skies month after month it appeared earlier and earlier until midsummer, when

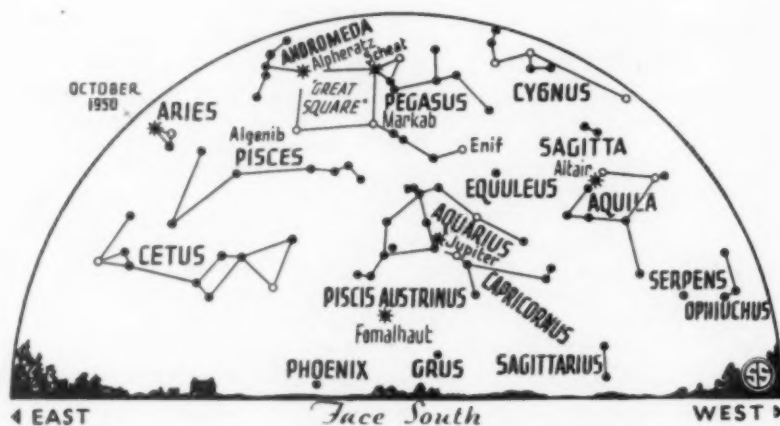
it began to be prominent during the evening as it is now.

Until the end of June Jupiter's movement among the stars had been from west to east, taking it from Capricornus into Aquarius. But on June 27 it seemed to stand still and then to start back towards Capricornus again. On Oct. 24 it almost reaches the border of that constellation, but again it is stationary. One can see this during the month by noting its position with respect to the star in Aquarius shown just below the planet. After Oct. 24, its movement is again toward the east.

Movements of the Planets

Such movements of the planets were most puzzling to the ancient astronomers, who thought the earth to be fixed, with all the heavenly bodies revolving around it. That meant, if true, that when a planet seemed to go backwards for a time, it could really reverse its movement. One explanation that held sway for many centuries was the Ptolemaic theory. It was first proposed by a Greek astronomer, named Hipparchus, who lived on the island of Rhodes around 130 B. C.

Since a circle was considered the only "perfect" figure, it was supposed that the heavenly bodies had to move in circles. Hipparchus proposed that they moved in a series of circles. Jupiter, for example, revolved once every 399 days in a small circle called an epicycle. The center of this epicycle moved once in 12 years around a larger circle called the deferent, which had the earth at its center. Thus, the general progression was toward the east, though sometimes the movement in the small circle made it go westward for a time. The other planets moved on similar deferents and epicycles. As the planetary movements were further studied, it was occasionally found that a single epicycle would not explain



◊ * • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



the observations, so others were added, one on top of another. Finally this became so complex that, as one famous astronomer remarked, "the music of the spheres became lost in a whirl of machinery!"

Theory of Copernicus

The theory of the Polish astronomer Copernicus, first published in 1543 and developed by others, brought a great simplification of this by having the earth itself as one of the planets, all of which revolve about the sun. According to these ideas, now known to be correct, the movements we observe in the skies are combinations of those of the object itself and this moving earth from which we make the observations.

As one travels in an express train and overtakes a freight on the next track, it may appear that the slower train is actually going backwards, though one knows they both are moving the same way. The nearer a planet is to the sun, the faster in miles per second is its speed. Consequently when we are in the same direction from the sun as Jupiter we overtake it. As we view it against the background of distant stars, it seems to be moving backwards for a time.

Time Table for October

Oct.	EST	
1	12:28 a. m.	Algol (variable star in Perseus) at minimum brightness
2	8:00 p. m.	Mercury farthest west of sun, visible for a few days low in east at dawn
3	9:16 p. m.	Algol at minimum
4	2:53 a. m.	Moon in last quarter
6	4:00 a. m.	Mercury passes Saturn
	6:05 p. m.	Algol at minimum
9	9:28 p. m.	Moon passes Saturn
10	7:32 a. m.	Moon passes Mercury
11	8:33 a. m.	New moon
12	11:00 p. m.	Moon nearest, distance 224,300 miles
15	4:00 a. m.	Moon passes Mars
17	11:18 p. m.	Moon in first quarter
20	10:27 a. m.	Moon passes Jupiter
21	2:09 a. m.	Algol at minimum
22	early a. m.	Meteors visible from constellation of Orion
23	10:57 p. m.	Algol at minimum
24	9:00 a. m.	Jupiter stationary (has been moving west since end of June but now resumes easterly motion)

25	3:46 p. m.	Full moon
26	7:46 p. m.	Algol at minimum
28	3:00 p. m.	Moon farthest, distance 252,400 miles

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, September 23, 1950

TEXTILE ENGINEERING

"Funginert" Materials Not Hurt by Fungi


► "TO SPOT the stuff that mold can't hurt

A new word's coined—say funginert."

And it is a word that means better, longer-lasting equipment of all kinds for the GI's in Korea. Soldiers have found that the ever-present fungi can cause severe damage to electrical equipment as well as many clothing materials. New materials, the funginerts, designed to have the property of not supporting fungus growth are replacing the older, more vulnerable ones.

The word was coined by Dr. Walter N. Ezekiel of the Navy Department's Bureau of Ordnance. Also suggested by him are parallel words, such as "bacterinert" and "microbinert." These would spot cases in which it is desired to describe materials inert to bacteria or to microorganisms in general, he states in the journal, *SCIENCE* (Sept. 1).

Science News Letter, September 23, 1950



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VETERINARY MEDICINE

Accurate, Fast Test for Foot-and-Mouth Disease

► A FAST new test for one of the most dreaded viruses in the cattle world has come in Mexico's battle against foot-and-mouth disease.

This is the plague which closed the Rio Grande to all livestock shipments more than three years ago. The new technique of the U.S.-Mexican Aftosa Commission in pinning the disease down was reported at the meeting of the American Veterinary Medical Association by Drs. Fernando Camargo, Ervin A. Eichhorn, Jacob M. Levine and Alfredo T. Giron, all of Mexico City.

The new test has an error of less than one percent. It can tell the foot-and-mouth virus from a similar infection called *vesicular stomatitis*, and can correctly identify different strains of these diseases. It can cut to a few hours the time required to spot foot-and-mouth disease in specimens sent to the laboratory, and hence speed up the isolation of infected animals.

Veterinarians revealed these other new tricks:

Cortisone, the anti-arthritis wonder drug, is now being used successfully to treat cattle with ketosis, a disease marked by changes in the pituitary gland and adrenal cortex. The work was reported by Drs. J. C. Shaw, B. C. Hatzioles and E. C. Leffel of the University of Maryland.

Dr. Myron Thom of Pasadena, Calif., said X-rays and radium can be used to treat lame race horses. Radiation helps the animal's system to flush away bacteria and debris in injured tissues, reducing pain and swelling and speeding natural repair processes.

Science News Letter, September 23, 1950



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GENERAL SCIENCE

U. S. Losing Science Race?

Our practices for control of subversives may cause the U. S. to lose ground in the science race. Scientific progress is based on free exchange of information.

► THE United States may lose out in the race to stay ahead of other nations in the field of science. If so, the blame will fall on the current government practices for the control of subversives. A warning that there should be a revision of the present loyalty and security programs was sounded in Ithaca, N. Y., by Prof. Walter Gellhorn of Columbia University in the book *SECURITY, LOYALTY AND SCIENCE*. This is the first in a series of eight reports to be issued by Cornell University on the impact on civil liberties of present practices to insure internal security.

"On the whole our national policies about secrecy in scientific matters are intelligently formulated. But the policies seem too inflexibly applied," Prof. Gellhorn states. "All history demonstrates that problems solved by the laboratories of one country ultimately yield to research in others, so that permanent bottling up of 'secrets' is a virtual impossibility," he continues.

Aimed at desirable objectives, the facts still remain that: 1) the progress that produces our "secrets" depends on free exchange of scientific information; 2) scientific teamwork is unnecessarily hindered

by security regulations; 3) scientific research is often duplicated because normal communication channels are blocked off by "compartmentalization;" 4) science students are receiving "imperfect training" in basic subjects because there is not access to new discoveries and 5) that experienced scientists are discouraged from entering research in classified subjects by the "fear of smear."

Prof. Gellhorn makes a strong case for the revision of the loyalty and security programs he believes is necessary. Loyalty clearance should be reserved for "sensitive" areas, he declares. "The extension of personnel security clearances into areas in which they are not demonstrably necessary protects no national interest."

Discussing the Fuchs case, Prof. Gellhorn states that grave as was his dereliction of duty, his misdeeds might "still cost the United States less dearly than would excessively rigorous controls."

"American strength rests upon advance rather than upon nervous hoarding of present scientific knowledge," Dr. Gellhorn concludes.

Science News Letter, September 23, 1950

CHEMISTRY

Non-Mildewing Cotton

► MILDEW-resistant cottons for the battlefield or for the home are promised as a result of a theory advanced on how cotton is attacked by microorganisms.

A thin layer of resistant material would be the protective barrier, and would be produced by a chemical reaction on the surface of the fiber.

Also, Dr. Ralph G. H. Siu of the Quartermaster General Laboratories, Philadelphia, states, since the degree of resistance does not depend upon the nature of the coating material, it should be possible to use substances "which by their very nature possess other desirable characteristics, such as flameproofness, water-repellency and photo-chemical stability."

Although the studies so far have been carried out on a laboratory scale only, Dr. Siu suggests that in plants the finished fabric could be coated by passing it through a reagent bath and a baking oven.

The cotton fiber itself is a twisted ribbon about an inch long and a thousandth of an inch in diameter. It is covered with a thin outer layer and contains a large

central canal running the length of the fiber.

The cellulose of which the cotton is composed is attacked by either fungi or bacteria only at the point of immediate contact between the organism and the cotton fiber. Dr. Siu believes that the organism secretes chemical substances, or enzymes, that make the cellulose soluble. He calls these enzymes "cellulase."

Since the organisms do act only at the point of contact, surface or topochemical treatment of the fabric is practical, he reports (*TEXTILE RESEARCH JOURNAL*, May).

Science News Letter, September 23, 1950

METEOROLOGY

Rain to Continue On East Coast

► THAT rain the East had for the first two weeks in September will probably continue in amounts greater than normal during Sept. 15-Oct. 15 period. The U. S. Weather Bureau's Extended Forecast Section predicts greater than normal rainfall

not only for the east coast, but also for the Ohio Valley until Oct. 15.

West of the Continental Divide, it will not rain as much as it usually does during the mid-September to mid-October period. That goes for along the Gulf Coast, in Texas and in the upper Great Lakes region.

Fall weather, for the next few weeks, will be cooler than usual in the northern plains region, the midwest and the northeast. However, west of the Continental Divide, and in Florida and Texas, it will be warmer than normal until Oct. 15. Other areas of the country can expect temperatures to be just about as usual.

The abundant rainfall in the East, predicted on the first of September for the month of September, has amply borne out the forecast.

Science News Letter, September 23, 1950

GENERAL SCIENCE

Minority of Drivers Cause Most Accidents

► DEATHS from highway traffic accidents would greatly decrease if all drivers with bad accident records were debarred from driving.

Accident "repeater" culprits are now recognized as the cause of most of our so-called accidents, it is stated in a study made in Minneapolis by the Northwestern National Life Insurance Company. Four out of every five so-called accidental deaths and injuries are "invited" or directly caused by people with "death-and-injury-producing habits."

Several surveys of traffic accident records are quoted in the study. During a six-year period in Connecticut, 4% of the state's drivers had 36% of the accidents. In other surveys in other states, it was found that from 5% to 10% of the drivers regularly contribute more than half the total traffic accidents.

British and American researches going back through 30 years of casualties have demonstrated that about 20% of the population consistently have 80% of all accidents of all kinds.

Drivers with repeated accidents almost always have accompanying records of repeated traffic law violations, the study shows. According to a study in Michigan, 100 accident repeaters had had 528 accidents and had been arrested 769 times for traffic law violations in a ten-year period.

A certain number of accident repeaters are found by various clinical tests to be abnormal personalities needing medical or psychiatric treatment. Some of the drivers were found to be defective in eyesight, hearing or muscular response. The vast majority, however, are simply persons with bad habits and wrong mental attitudes of resentment or contempt toward rules, regulations and common courtesy.

Science News Letter, September 23, 1950

ENTOMOLOGY

Potasan Punches Pests

➤ A NEW nerve-gas insecticide called E-838 or "Potasan" has joined the list of deadly chemicals which make the modern American farm a very dangerous place for the insects—and sometimes for the men who fight the insects.

"Potasan," a trade name, was described in Washington to scientists and government agricultural experts about to conclude the most far-reaching Federal hearings ever held on the chemicals used by U. S. fruit and vegetable growers.

The new insect poison is a close cousin of parathion, one of the most effective agricultural chemicals developed since World War II. Like parathion, E-838 was discovered originally by a German chemist, the brilliant Dr. Gerhard Schrader of I. G. Farben, during a wartime search for new poison gases.

Dr. Schrader produced the so-called "nerve gases," incredibly toxic compounds that were never used in the war. Among the same chemical family were substances which proved to be potent insecticides—parathion, TEPP, HETP and now E-838, developed within the past two years.

Present indications are that E-838 will deliver a Sunday punch to such costly U. S. farm pests as the Colorado potato beetle and the red spider mite, Thomas F. Cleary, official of the Chemagro Corp., testified at the Food and Drug Administration hearing.

He said the new poison (which has the tongue-twisting technical name of diethoxy thiophosphoric acid ester of 4-methyl-7-hydroxy coumarin) has been tested also against the costly codling moth in apple orchards, the Mexican bean beetle, Southern armyworm, cabbage worm, onion thrip and pea aphid.

Such phosphorus compounds, being linked to the nerve gases, are also extremely dangerous to man. The American Medical Association warned that extreme caution must be used in handling these new insecticides. Already they have caused deaths and numerous severe poisonings. Protective clothing as well as gas masks must be used in the field or orchard, for the chemicals can be absorbed through the skin as well as inhaled.

Evaluation of the health hazard to the U. S. consumer from these and other modern-day agricultural chemicals is the goal of residual tolerance hearings which began in Washington last January, and which ended Sept. 15.

More than 9,000 pages of testimony were taken. Experts from the U. S. Public Health Service, FDA, Department of Agriculture and most major U. S. chemical companies testified on the necessity as well as the possible danger of using chemical

weapons now available to fruit and vegetable growers.

Nearly all chemicals used as insecticides, fungicides and weed killers have been studied. Final goal of the project—after lengthy briefs have been filed by witnesses and a proposed set of regulations perhaps battled out in court—will be new Federal rules regulating the permissible amounts of chemical residues on fruits and vegetables traveling from truck farms and orchards to the nation's dinner table.

Science News Letter, September 23, 1950

PSYCHOLOGY

All Work, No Play Does Make Jack Dull Boy

➤ THE "All work and no play makes Jack a dull boy" saying gets scientific support from a study by Dr. Frederic T. Jung of Chicago, Ill. The report will particularly please the Jacks—and Jills—who complain about too much school work without enough vacations.

The study, made on students carrying accelerated courses at Northwestern University School of Medicine, also carries a warning to scholarly students. They, Dr. Jung found, are "inclined to slight their physical needs."

Both physical fitness and enthusiasm, Dr. Jung found, declined measurably during long uninterrupted periods of schooling, and both rose significantly during an interval that included a vacation.

Science News Letter, September 23, 1950

GEOLOGY

Plants 100,000,000 Years Old in Colorado

➤ TAKING his bearings by the fossils of strange plants millions of years old, a government geologist has pinned down the age of a slice of Colorado.

Dr. Roland W. Brown of the U. S. Geological Survey, in a professional paper published in Washington, reports that a rock layer covering uranium ore deposits in southwestern Colorado dates from the time when birds and flying reptiles first appeared on earth, and the time when dinosaurs and giant reptiles were becoming extinct.

Much of his detective work was done by studying plants preserved in the rock. These included cycads—plant half-way between tree ferns and palms—as well as ordinary ferns and flowering plants. Among his specimens, Dr. Brown says, are four species previously unknown, four plants which grew in Colorado perhaps 100,000,000 years ago in America's Cretaceous Age.

Science News Letter, September 23, 1950

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ZOOLOGY NATURE RAMBLINGS



Caterpillars

► IF humans could only control caterpillars with some sort of radio directing device, the drudgery of clipping hedges, mowing lawns, pruning trees and weeding the garden would be over for all time. Lucullus was a dainty eater compared to the caterpillar. With shearing jaw-action spurred on by prodigious appetite, this fuzzy little monster spends most of its young life chomping away at flowers, foliage, or food in the garden. He chews and chews and chews and chews. The more he eats, the bigger he grows, and the bigger he grows, the more he eats.

The coming of fall sends most caterpillars off to hibernation, spun in rough silky cocoons. But there are some which seem to care nothing for first hints of frost. Bristling little orange-and-black fellows, commonly called woolly bears, nonchalantly hump themselves across the sidewalk on warm September and October days. When winter does come, the woolly bear merely hunts himself a well-sheltered corner, curls up and goes to sleep without the formality of a silken sleeping bag. He dreams of early spring, when he will begin eating again, fattening up for the mysterious transformation into a butterfly or gauze-winged moth.

Caterpillars are unpleasant-looking creatures, except perhaps to other caterpillars. Some have gaily-colored coats, but many

more are naked, squidgy things, like the cabbage worm or green maple worm. The bigger they are, the more repulsive they are to the squeamish—the cecropia, with its rows of stiff, short bristles; the tobacco caterpillar, with its long horn to whack you if you meddle too persistently; the puss and the sphinx which rear up and try to stare you out of countenance.

The caterpillar's life is a hazardous one. His soft, helpless, juicy body is a choice morsel for birds, wasps, ants and other insects. Fungi prey upon him, and man attacks him with poisonous chemicals. But his most terrifying enemy is the family of parasites which likes nothing better than to eat him alive from the inside out.

At Yale University this summer, a giant horde of orange and black caterpillars

threatened for a time to strip away every trace of ivy from the sleeping walls. Then nature sent in her shock troops. Countless flies appeared; like low-flying bombers, they deposited their eggs just behind the caterpillars' heads.

The eggs hatched into tiny white maggots in a few days. Straight-away the larvae burrowed into the bodies of the caterpillars, fastening themselves on the tissues of their unwilling hosts, growing larger as they fed.

At the last, discouraged, sick and robbed of the fat built on ivy leaves, the caterpillars one by one stopped eating, their brilliant stripes turned to a dull yellow, and they fell from the tattered ivy to the ground.

Science News Letter, September 23, 1950

RADIO

Hams Aid Invasion Plans

► PLANNING communications for large-scale invasions, such as that at Normandy, will be greatly aided by studies being made of reports from "hams," or amateur radio operators.

Rapid communication between field units and headquarters is particularly essential during an invasion. If normal radio channels are blacked out by severe atmospheric storms, there must be emergency ones that can be used immediately.

Every now and then, to a ham's delight, he will be able to contact another operator far beyond his usual range. Until recently no systematic record was kept of these unexpected conversations beyond the normal contact range, other than for the ham's purpose of learning which operator had talked with the most persons and at what distances.

Last year, however, the hams were asked to report their contacts at unusual distances to O. P. Ferrell of the Scientific Radio Observation, Inc., in Philadelphia.

N. C. Gerson of the Air Force's Cambridge Research Laboratories has now reported in the journal, *NATURE* (Aug. 19), the first results of analysis of the data sent in by hundreds of amateurs.

Wavelength used by the hams was 50 megacycles. Most radio waves, such as those used for daily broadcasts, are reflected back to earth from the ionosphere. The 50 megacycle wavelengths, however, pass right through these reflecting layers. But if there is intense ionization in the region known as the sporadic E-layer, the 50 megacycle waves will be reflected back to the earth.

It works like this: At 10:00 one night, Joe in Cleveland makes contact with Jim in San Antonio; at 10:30 with Dick in Denver; but he cannot during this time make contact with operators in Miami, approximately the same distance as Denver, but in a different direction. He reports these facts.

Analysis of hundreds of reports, including both contacts made and those that were attempted but not successful, gives the information about how fast the sporadic E-layer is moving and in what direction.

As more is learned about this layer, frequencies can be assigned for emergency use when the normal ones are blacked out by atmospheric storms.

On May 15, 1949, four very definite sporadic E-layer regions were found above the United States. They seemed to move at a speed of about 100 to 200 miles per hour. "The possibility of some type of anticyclonic motion in the upper atmosphere is suggested," Mr. Gerson states, by the combined motions of two of the areas with respect to the other two.

Science News Letter, September 23, 1950

GENERAL SCIENCE

Life-Span of Wage-Earners, Families Increasing

► LENGTH of life for the American wage-earners and their families has been steadily increasing for the past half-century and more.

Expectation of life at birth is now 67.7 years for the many millions of industrial policy-holders of the Metropolitan Life Insurance Company. Average lifetime among this large section of the industrial population has doubled since 1879-1889, earliest period for which figures are available.

The improvement in mortality and longevity during the past 40 years has been greater in the industrial population than in the population of the United States as a whole.

"This achievement of the rank and file in our country," the life insurance statisticians point out, "has broad implications and gives added meaning to the phrase, 'the American way of life.'"

Science News Letter, September 23, 1950

HOUSES OF EARTH

The ground you stand on is your best building material. Easy to build—insulated against heat and cold. Ratproof—Soundproof—Termiteproof and Fireproof. Book based largely on findings of the Bureau of Plant Industry, Soils and Agricultural Engineering. Low Building and Upkeep costs.

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AUSTRALIAN JOURNAL OF APPLIED SCIENCE, Vol. I, No. 1—N. S. Noble, Ed.—*Commonwealth Scientific and Industrial Research Organization*, quarterly, 132 p., in Australian money: 30 shillings per year (Approx. \$3.36 in U. S. money). The purpose of this journal is to report results of original investigations in the field of applied science.

AUSTRALIAN JOURNAL OF MARINE AND FRESHWATER RESEARCH, Vol. I, No. 1—N. S. Noble, Ed.—*Commonwealth Scientific and Industrial Research Organization*, issued as material becomes available, 154 p., illus., in Australian money: 7 shillings, 6 pence (Approx. 85 cents in U. S. money). Primarily designed to report results of original investigations on sea and freshwater fisheries and related subjects.

AUTOMATIC AND MANUAL FIRE ALARM SYSTEMS: Inspection, Tests and Maintenance—War Department—U. S. Dept. of Commerce, Tech. Manual TM 5-696, 66 p., illus., paper, \$1.75. A manual covering certain general principles relating to the inspection and maintenance of building fire alarm systems.

AUTOMOBILE FACTS AND FIGURES—*Automobile Manufacturers Association*, 30th ed., 80 p., illus., paper, free upon request to publisher, Transportation Building, Washington 6, D. C.

CALORIE REQUIREMENTS: Report of the Committee on Calorie Requirements, Washington, D. C., U. S. A. 12-16 September 1949—*Food and Agriculture Organization of the United Nations* (U. S. Distributor: Columbia University Press), illus., paper, 75 cents.

COLLOID CHEMISTRY: Theoretical and Applied, Vol. VII—Jerome Alexander, Ed.—*Reinhold*, 736 p., illus., \$15.00. A compilation of papers written on theory and methods, biology, medicine and technology by many international contributors such as Charles A. Southwick, Jr., Alexander S. Wiener and Jerome Alexander.

THE CONTROL OF COMMUNICABLE DISEASES IN MAN: Report of a Committee of the American Public Health Association—*Gov't. Printing Office*, Reprint No. 1697 from the Public Health Reports, 159 p., paper, 40 cents.

ENGINEERING ECONOMY—H. G. Thuesen—*Prentice-Hall*, 501 p., illus., \$6.65. A book to aid economic analyses of engineering problems.

EROSION STUDIES AT PARICUTIN, STATE OF MICHOACAN, MEXICO—Kenneth Segerstrom—*Gov't. Printing Office*, Geol. Survey Bull. 965-A, 164 p., illus., paper, \$1.00. Many valuable maps and illustrations of this well-known volcano are included.

FLORA OF ILLINOIS: Containing Keys for Identification of the Flowering Plants and Ferns—George Neville Jones—*University of Notre Dame Press*, 2nd ed., 368 p., \$4.25.

FORAGE AND PASTURE CROPS: A Handbook of Information about the Grasses and Legumes Grown for Forage in the United States—W. A. Wheeler—*Van Nostrand*, 752 p., illus., \$10.00.

FOREST PLANTATIONS IN THE LAKE STATES—Paul O. Rudolf—*Gov't. Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1010, 171 p.,

illus., paper, 45 cents. A report of the upkeep of forests in the states of Minnesota, Wisconsin and Michigan.

GEOLOGY AND GROUND-WATER RESOURCES OF RICE COUNTY, KANSAS—O. S. Fent—*State Geological Survey of Kansas*, 142 p., illus., 25 cents mailing charge per copy. A report describing the geography, geology and ground-water resources of Rice County in central Kansas. A map is included.

GEOLOGY OF THE COASTAL PLAIN OF NORTH CAROLINA—Horace G. Richards—*American Philosophical Society*, 83 p., illus., paper, \$1.50. This report covers the formations from the cretaceous to the recent.

A HISTORY OF CHINA—Wolfram Eberhard—*University of California Press*, 374 p., \$4.50. The fundamentals of the Chinese social system and of Chinese history.

INDIANS OF THE LONGHOUSE: The Story of the Iroquois—Sonia Blecker—*Morrow*, 160 p., illus., \$2.00. A children's book telling how the great Iroquois nation lived before the white man invaded it.

THE NEW YORK STATE DEPARTMENT OF MENTAL HYGIENE PRESENTS CHIC YOUNG'S BLONDIE: In Scapegoat, Love Conquers All, Let's Face it and On Your Own—Joe Musial, producer—*Department of Mental Hygiene, State of New York*, approx. 14 p., illus., paper, free upon request to publisher, Albany, N. Y., to those recognized agencies and organizations interested in the promotion of mental health. The well-known comic strip characters of Chic Young's BLONDIE have been put to work to demonstrate four basic mental hygiene principles.

PHYSIOLOGY AND ANATOMY—Esther M. Greisheimer—*Lippincott*, 6th ed., 841 p., illus., \$4.00. A standard college text brought up-to-date.

PNEUMOCONIOSIS: Beryllium Bauxite Fumes—Compensation—Arthur J. Vorwald, Ed.—*Hoeber*, 659 p., illus., \$7.50. A record of the Sixth Saranac Symposium held in the fall of 1947 considering many aspects of beryllium and bauxite fumes as they relate to industrial health.

SEA SLANG OF THE TWENTIETH CENTURY—Wilfred Granville—*Philosophical Library*, 271 p., \$3.75. A dictionary of British naval slang.

SECURITY, LOYALTY, AND SCIENCE—Walter Gellhorn—*Cornell University Press*, 300 p., \$3.00. A study of the administration of security policies in "sensitive" areas. (See SNL, Sept. 23, p. 204).

SIR WILLIAM OSLER APHORISMS FROM HIS BEDSIDE TEACHINGS AND WRITINGS—William Bennett Bean, Ed.—*Schuman*, 159 p., \$2.50. Observations on the practice of medicine made by Dr. Osler.

SONG OF THE SEASONS—Addison Webb—*Morrow*, 127 p., illus., \$2.50. Child's book telling how the seasons affect animals.

A TEXTBOOK OF BIOCHEMISTRY—Philip H. Mitchell—*McGraw-Hill*, 2nd ed., 695 p., illus., \$6.00. A college text brought up-to-date.

THEORY OF ELEMENTARY CHEMICAL ANALYSIS—Thomas H. Whitehead—*Ginn*, 233 p., illus., \$2.75. A basic analytical chemistry textbook which includes material for both qualitative and quantitative inorganic analysis.

VOLCANOES OF THE PARICUTIN REGION MEXICO—Howell Williams—*Gov't. Printing Office*, Geol. Survey Bull. 965-B, 279 p., illus., paper, 65 cents. A brief history well illustrated with maps and photographs.

WATER AND MAN: A Study in Ecology—Jonathan Forman and Ollie E. Fink, Eds.—*Friends of the Land*, 407 p., illus., \$4.50. A monograph on man's use and care of water.

Science News Letter, September 23, 1950

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• New Machines and Gadgets •

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✿ **BUTANE LIGHTERS** for smokers, using the butane gas which is delivered in tanks to thousands of homes for cooking purposes, have replaceable cartridges of the gas which hold a supply great enough to last several months. This light-weight lighter has no wick, fluid or odor.

Science News Letter, September 23, 1950

✿ **ZIGZAG ATTACHMENT** for sewing machines makes easy the job of zigzag stitching on home-made garments, and produces results from almost invisible stitching to boldly decorative effects. Straight stitching, without removing the attachment, is obtained by a lever adjustment.

Science News Letter, September 23, 1950

✿ **BICYCLE ENGINE**, a British product claimed to give about 250 miles to a gallon of gasoline, is a two-stroke engine that comes mounted on a special wheel to replace the regular rear wheel. The replacement can be fitted to any bicycle, and weighs a total of 20 pounds.

Science News Letter, September 23, 1950

✿ **PLASTIC MICROPHONE**, for use with an office dictating machine, not only receives dictation but will play back the last words for review. When a switch,



shown under the thumb in the picture, is pushed up the machine records. For playback the switch is pushed down.

Science News Letter, September 23, 1950

✿ **ALUMINUM CONTAINER**, for home and other canning, is a German development similar to the long-used glass jar with lid, rubber sealing ring and clamp. The

aluminum is protected from chemical action due to contact with the food by a protective lacquer.

Science News Letter, September 23, 1950

✿ **CARD SHUFFLER**, for canasta players, is claimed by the manufacturer to shuffle cards 40 ways in one speedy operation and offer them cut ready for play. It is a device easily operated by the amateur, and is an ideal box in which to keep cards.

Science News Letter, September 23, 1950

✿ **ELECTRIC POWER** generator, for medium-power dielectric heating in work with plastics, wood, rubber, textiles and food, is push-button operated, motor-driven and has a self-contained power output control. It utilizes a line voltage of 230 volts and employs two heavy-duty air-cooled power tubes.

Science News Letter, September 23, 1950

✿ **FLASHING SIGNALS**, to give warning of an automobile turn, are easily installed with a kit which contains everything needed to convert front parking lamps and rear tail lights to do the job. Turn signals are operated by a switch on the steering wheel.

Science News Letter, September 23, 1950

Do You Know?

The coconut is one of the largest seeds in the world.

Japan's tea production is now about 60% of its prewar amount.

Giant redwood trees of the West started from tiny seeds about one-sixteenth of an inch long.

Over 200,000,000 pounds of copper and its alloys will be used in America this year in household labor saving devices.

Addition of castor oil to the paint used in marking highways improves sticking qualities and prevents chipping off.

Ancient Hebrew manuscripts, found recently in rolls of leather and papyrus in a cave near the Dead Sea, are said to be at least 20 centuries old.

Cotton, jute, rice and tea will be sent from Pakistan to Poland under a new trade agreement, and Poland will send the Asiatic nation coal, chemicals, textiles and minerals.

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